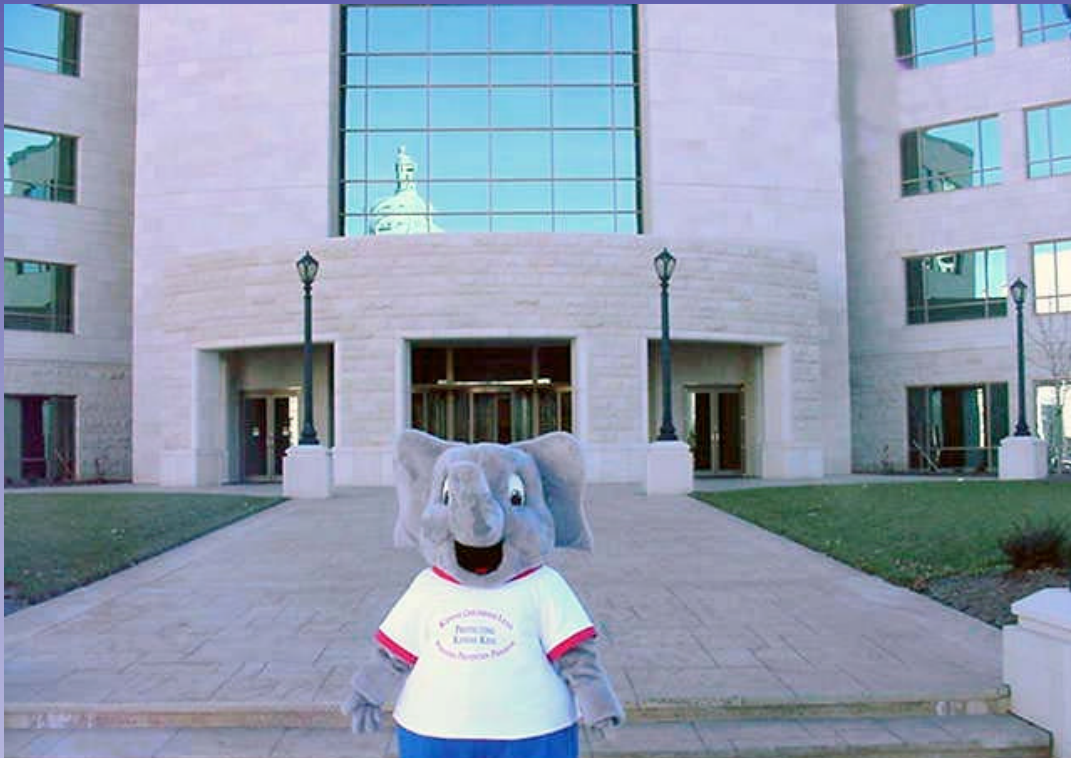


KANSAS CHILDHOOD LEAD POISONING PREVENTION PROGRAM



**ANNUAL REPORT
JANUARY 1, 2001 - DECEMBER 31, 2001**

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KANSAS
DEPARTMENT OF HEALTH & ENVIRONMENT
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**A message from the Director of the Kansas Childhood
Lead Poisoning Prevention Program**

Dear Reader,

Welcome to the 2001 Kansas Childhood Lead Poisoning Prevention Program Annual Report. The Kansas Childhood Lead Poisoning Prevention Program was established in 1997 and has grown in both the scope of activities undertaken and resources available. The purpose of this first annual report is to highlight the major activities conducted by the members of the program during 2001 to the general public, private and public health and environmental organizations, and government agencies. In 2001, the program assisted local health departments and coalitions with a variety of direct and indirect resources, developed and distributed a recommended blood lead screening plan to assist health departments and private providers, began compliance assistance and enforcement actions in regulatory areas, initiated an Adult Blood Lead Epidemiology and Surveillance program, conducted a major multi-media awareness campaign to educate the public and private industry on lead hazards. The Kansas Childhood Lead Poisoning Prevention Program also relocated to the new Curtis State Office Building from the Mills Building.

To increase public availability and usability of this report, it is available in printed form, on compact disk and accessible from the Kansas Childhood Lead Poisoning Prevention Program website: www.unleadedks.com.

I encourage you to contact members of specific programs with your questions, comments and to make suggestions to assist Kansas in achieving the national goal of eliminating Childhood Lead Poisoning by 2010.

Barry Brooks
Director

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EXECUTIVE SUMMARY

The Kansas Department of Health and Environment (KDHE) established the Kansas Childhood Lead Poisoning Prevention Program (KCLPPP) to respond to concerns about lead and its effect on the health of Kansans, most notably our children. Lead is common in our environment and many individuals, especially children, show no outward signs of lead poisoning.

The mission of the Childhood Lead Poisoning Prevention Program is to establish an infrastructure of trained personnel to screen, identify and recommend proper medical and environmental management of lead-poisoned children. The KCLPPP is divided into three subsections: Medical Surveillance, Licensure and Certification, and Pre-Renovation Education (PRE). The Medical Surveillance division is primarily concerned with increasing blood lead screening among children ranging in age from six months to 72 months, considered the at-risk age group. A child found to have an elevated blood lead level, classified as a level at or above 10 micrograms per deciliter (: g/dL), is tracked by the program to ensure proper medical attention is taken. The Licensure and Certification division of the program is in charge of licensing firms and certifying individuals to perform lead abatement work, lead inspections, and risk assessments. Environmental investigations are crucial in determining the source(s) of lead poisoning. The Pre-Renovation Education program is designed to educate the public as well as general contractors and landlords on the hazards associated with remodeling and renovation of pre-1978 housing.

Based on 1998 Centers for Disease Control and Prevention (CDC) guidelines, Kansas implemented a universal screening recommendation: Using a blood lead test, screen all children at 12 and 24 months of age and screen all children from 36-72 months of age who have not been screened previously. High-risk children should have a first blood lead test at six months of age. Medical evaluation and environmental investigation and remediation should be done for all children with blood lead levels at or above 20 : g/dL.

The KCLPPP aims to continue to increase screening among children up to 72 months of age while reducing the number of children with elevated blood lead levels, eliminate lead hazards in the environment and continue to educate the community on the hazards associated with lead exposure. The goal of the KCLPPP is the total elimination of childhood lead poisoning by 2010.

Program Highlights

■ Children testing for lead poisoning.

- 10,541 children, birth to 18 years of age, received a blood lead test during calendar year (CY) 2001. The number of children tested in CY 2001 nearly doubled from CY 2000 in which 6,813 children were tested.
- 664 children, birth to 18 years of age, had blood lead test results greater than or equal to 10 : g/dL in CY 2001. This means that 6.3% of children tested in CY 2001 have reached blood lead levels that the CDC has stated may cause health and/or developmental problems in children. This number has risen from 516 children in CY 2000, an increase of 28.7%.
- 542 children representing 5.1% of total children tested in CY 2001, birth to 18 years of age, had blood lead levels greater than 10 : g/dL but less than 20 : g/dL in CY 2001. This number has risen from 409 children in CY 2000, an increase of 32.5%.
- 122 children representing 1.2% of total children tested in CY 2001, birth to 18 years of age had blood lead tests results at or above 20 : g/dL in CY 2001, the level at which environmental investigation is required under state regulations. This number has risen from 107 children in CY 2000, an increase of 14%.

■ Results by county.

- 76 out of the 105 counties in Kansas reported one or more children, ages birth to 18 years of age, as having an elevated blood lead test result in CY 2001.
- Sedgwick County reported the greatest number of children with elevated blood lead levels in CY 2001. Of the 768 children tested in Sedgwick County, birth to 18 years of age, 66 had blood lead levels at or above 10 : g/dL. This accounts for 8.6% of the children tested within Sedgwick County and 9.9% of children found to have blood lead levels at or above 10 µg/dL statewide.
- Wyandotte and Shawnee counties ranked second and third respectively for the total number of children with blood lead levels at or above 10 µg/dL in CY 2001. Wyandotte County reported 64 children with elevated blood lead levels while Shawnee County reported 51.
- Wyandotte County reported the greatest number of children tested for lead poisoning, ages birth to 18 years, with 1,000 children tested in CY 2001. Of the 1,000 children tested, 64 were found to have an elevated blood lead level at or above 10 : g/dL. This is 6.4% of children tested in Wyandotte County and 9.6% of children found to have blood lead levels at or above 10 : g/dL statewide.

■ Environmental Investigations.

- 48 notices of children with blood lead test results at or above 20 : g/dL were presented to the state in CY 2001.
- 5 lead-based paint hazard abatements were completed by December 31, 2001.
- 30 firms were licensed to perform lead abatement work in CY 2001.
- 298 individuals were certified as either supervisors or workers to perform lead abatement work in CY 2001.
- 46 firms were licensed to perform risk assessment activities in CY 2001.
- 89 individuals were certified to perform risk assessment activities in CY 2001.
- 50 firms were licensed to perform lead inspections in CY 2001.
- 48 individuals were certified to perform lead inspections in CY 2001.
- 25 elevated blood lead inspections were completed in CY 2001.



Elevated blood lead investigation in Greenwood County. The storm shelter shows deteriorated lead-based paint.



Lyon County elevated blood lead investigation. The house is undergoing massive renovation efforts.



Lead abatement project in Wichita. This was one of five abatement projects completed in 2001.

■ Activities to reduce lead poisoning.

- Provided \$93,250 in grant funds to 18 different health departments and one professional lead organization for purposes of administering blood lead testing to WIC participants ages one and two and children 30-60 months or administering a lead poisoning prevention program.
- Launched a \$60,000 ad campaign in the top six counties most at risk for lead poisoning according to the KCLPPP County Burden of Risk Matrix (See Table 1). The campaign was designed to increase awareness and blood lead screening. The six counties targeted through this campaign contain 50% of children in Kansas up to 72 months of age.
- Launched a \$40,000 ad campaign in the next 20 counties most at risk for lead poisoning according to the County Burden of Risk Matrix (See Table 1). Advertising was achieved through newspaper, radio and television ads as well as through billboards placed throughout the counties. The campaign targeted 31% of children up to 72 months of age.
- Reached a total of 81% of children in the state in the at-risk age group with the advertising campaign which is linked to an overall increase in blood lead screening of 50% compared to the same time period in 2000.
- Developed a program mascot to attend health fairs, festivals and numerous other events throughout the state. The mascot was designed to increase interest and lead awareness among children.
- Attended home shows statewide to educate those intending to remodel or renovate pre-1978 housing on proper techniques necessary to reduce lead hazards during these types of projects.
- Created a website equipped with lead safety tips and other general information concerning lead poisoning and its effects on growth and development.

■ Action Plan for 2002.

- Amend Kansas Statutes Annotated (KSA) 65-1, 200.
- Update publications to reflect changes in the regulations.
- Establish an Adult Blood Lead Epidemiology and Surveillance (ABLES) program to monitor elevated blood lead levels due to occupational or other means.
- Change reporting requirement (Kansas Administrative Regulations 28-1-18) to ensure all blood lead tests are reported to the state.
- Design and implement a \$65,000 advertising campaign to increase awareness among contractors of the Pre-Renovation Education regulation.
- Develop an enforcement and compliance plan.
- Increase enforcement actions for the Pre-Renovation Education program.
- Update and maintain a program website designed to inform and educate the public about lead hazards.
- Distribute case management guidelines for the lead-poisoned child.
- Distribute phase III and phase IV of the childhood blood lead testing plan.
- Apply for and receive a \$5,000 Home Depot grant to be used for a contractor outreach program aimed to educate contractors on techniques to minimize lead hazards while working in pre-1978 housing.
- Present at the National Lead-Safe Housing and Indoor Environmental Health Conference.
- Present at the Council of State and Territorial Epidemiologists conference.
- Develop a memorandum of understanding between the KCLPPP and the Occupational Safety and Health Administration (OSHA) to formalize a general referral system to reduce work related cases of lead poisoning.
- Submit Quality Assurance Project Plan for environmental sampling activities to the Environmental Protection Agency (EPA).

LEAD POISONING IN KANSAS

Lead is a highly ductile metal that has been used both commercially and residentially. Due to its strong ability to resist corrosion, lead can still be found in heavy machinery and equipment as well as major structural systems such as bridges. Lead is also found in leaded gasoline, which is commonly used by the agricultural and aviation industries, two dominant industries in Kansas. Lead has a remarkable ability to adhere to different types of surfaces and as a result lead-based paint was widely used up until the late 1970's. In 1978, the federal government banned residential lead-based paint.

Lead can be ingested or inhaled, both of which pose a serious threat to human health. Once lead has been ingested or inhaled, it enters the bloodstream and is distributed throughout the body. If not detected early enough, both children and adults are at risk for lead poisoning. Low levels of exposure to lead can cause memory and concentration problems, muscle and joint pain, and can affect nervous system function. High levels of lead exposure have been associated with nerve disorders, digestive problems and in extreme cases, coma or death. Lead enters the body through a variety of sources, some of which include:

- Lead-based paint
- Traditional folk remedies
- Food stored in lead soldered containers such as pottery and certain types of ceramic ware
- Drinking water contaminated by corroded lead pipes
- Soil and dust which has been contaminated

Since the virtual elimination of lead from gasoline in the early 1980's, lead-based paint has become one of the primary sources of lead exposure for children. The greatest concentration of lead in lead-based paint is found in pre-1950 housing. However, any dwelling built before 1978 may contain lead-based paint. In Kansas, this includes over 80% of housing units throughout the state (See Table 1). Due to the large amount of lead in the environment, all Kansas children are at risk. Children at increased risk for lead poisoning are those exposed to high doses of lead in their immediate environment. Some common sources of lead exposure include:

- Chipping, peeling or otherwise deteriorated lead-based paint surfaces
- Airborne lead dust as a result of remodeling or renovation work in which sanding or scraping of lead-based paint occurs
- Lead contaminated dust brought into the home by adults who work in an occupation or who are involved in a hobby that involves lead or materials containing lead

The KCLPPP has found one of the leading sources of lead poisoning within the state of Kansas is due to remodeling and renovation projects in housing built before 1978. Sanding and scraping lead-based paint creates airborne lead dust, which is easily inhaled. The lead dust created during these activities settles on surrounding surfaces, which can be extremely hazardous if children or pregnant women are present in the work area. Lead dust settles on the bodies of children near the work site and is typically ingested by normal hand-to-mouth activities. In the case of pregnant women, lead can be ingested and passed to the baby through the placental barrier creating the potential for lead poisoning in the infant before birth occurs.

In Kansas, there are 21 potential industry sources associated with lead (See Table 1). These industries expose hundreds of employees to lead everyday. Classification as a potential industry sources requires the use of at least 10,000 pounds of lead or lead compounds or otherwise manufacturing and processing a minimum of 25,000 pounds of lead or lead compounds in a year. If not careful, an adult exposed to lead through occupation or hobby has the potential to transfer lead dust to their vehicles or homes where other family members can become exposed.

ENVIRONMENTAL MANAGEMENT

The environmental portion of the KCLPPP includes the Pre-Renovation Education program as well as the Licensure and Certification program. The Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR) provide funding for these two divisions.

The Pre-Renovation Education (PRE) program is responsible for enforcing the lead-based paint Pre-Renovation Education rule. The Pre-Renovation Education rule is a collection of Kansas Administrative Regulations (KAR 28-71-51 to 28-71-54) affecting renovations and repairs in residential housing built before 1978. It was designed to provide residents of pre-1978 housing with information to help prevent lead exposure. Contractors, property managers, and others who perform renovation work for compensation in residential housing that may contain lead-based paint are required to distribute a lead pamphlet and a renovation notice to the housing owner and/or occupants before renovation begins. Confirmation of receipt of the lead pamphlet from the owner and/or occupants or a certificate of mailing from the post office must be retained for three years following the renovation project. For work in common areas of multi-family housing, the lead pamphlet and renovation notice must be distributed to owners and tenants of each affected unit. Emergency renovations and repairs and minor repairs and maintenance that disturb two square feet or less of paint per component are excluded from the Pre-Renovation Education rule. Zero-bedroom dwellings, housing for the elderly or disabled persons (unless children reside there) and housing or components declared lead-free by a certified inspector or risk assessor are also excluded from the Pre-Renovation Education rule. The PRE Program Manager recently received the Rising Lead Star Award at the National Lead-Safe Housing and Indoor Environmental Health Conference for outstanding service in the lead poisoning prevention and lead hazard control fields.

The Licensure and Certification program of the KCLPPP operates under the authority of KSA 65-1,200 and KAR 28-72. The program offers certification for six separate disciplines: Lead Abatement Worker, Lead Abatement Supervisor, Lead Inspector, Lead Hazard Risk Assessor, Project Designer and Elevated Blood Lead Inspector. Accreditation to training providers to offer both initial and refresher training for each of the disciplines is also offered by the program. The Licensure and Certification program further regulates lead activities in residential housing and child-occupied facilities in Kansas including lead abatement, lead inspections, lead hazard risk assessments, lead hazard screens, elevated blood lead level inspections and post-abatement clearance. The Licensure and Certification program is currently in the process of revising the KAR 28-72 to meet standards set by the EPA in 40 CFR (Code of Federal Regulations) §745.327(d) dated January 5, 2001 and to correct errors in the current regulations. These corrections include hazard levels for dust and soil, corrections to definitions, changes in experience requirements for abatement supervisors and pre-abatement notifications. The Licensure and Certification Program Manager was honored at the National Lead-Safe Housing and Indoor Environmental Health Conference with the Lead Star Award for developing one of the first reciprocity agreements between state lead programs to accept other states' certifications.



Lead abatement worker stripping paint at the future Brown vs. Topeka Board of Education Museum.

Environmental Protection Agency Program Grant Highlights

- **Pre-Renovation Education Program.** The Kansas PRE program is one of only two PRE programs in the United States. In effort to educate contractors and landlords on the PRE Rule, the PRE program accomplished the following highlights during CY 2001:
 - Distributed educational materials on the PRE Rule to hardware stores throughout the state (See Publication 2).
 - Distributed educational materials on the PRE Rule to building permit offices in cities with at least 5,000 residents (See Publication 2).
 - Collaborated with Westlake Ace Hardware and Whelan's hardware stores statewide to send educational information on the PRE Rule in all contractor billings.
 - Participated in landlord/contractor monthly meetings statewide.
 - Distributed educational materials to professors involved in coursework concerning renovation and/or remodeling. The informational packets were constructed to offer the professors an opportunity to have the PRE Program Manager present to their class or any student related organization about the PRE Rule (See Publication 4).
 - Attended home shows throughout the state to distribute material on the PRE Rule to contractors/renovators.
 - Participated in a Builders Association call-in radio program in Riley County.
 - Published over 25 articles in landlord association newsletters and homebuilder newsletters concerning the PRE Rule. The articles were presented in county and local publications as well as the Kansas Landlord Association newsletter, a statewide publication.
 - Participated in a Kansas City cable TV community show.

- **Licensure and Certification Program.** The Licensure and Certification program accomplished the following highlights during 2001:
 - Renewed reciprocity agreement with Missouri.
 - Established new reciprocity agreements with Nebraska and Texas.
 - Collaborated with Kansas Department of Commerce and Housing's Community Development Block Grant Program to ensure compliance.
 - Trained 15 child care and foster care regional supervisors as risk assessors.
 - Attended and presented at the National Lead-Safe Housing and Indoor Environmental Health Conference.
 - Purchased an X-Ray Fluorescent (XRF) machine for investigations and enforcement purposes.

Environmental Protection Agency Enforcement Grant Highlights

- **Pre-Renovation Education Program.**
 - Developed an enforcement response policy.
 - Performed compliance assistance visits to educate lead professionals and general contractors on Kansas' lead regulations.
 - Issued two notices of non-compliance.
- **Licensure and Certification Program.**
 - Developed an enforcement response policy.
 - Issued four notices of non-compliance.

Environmental Protection Agency Conference Grant Highlights

■ **Healthy Homes for Kansas Conference.** The KCLPPP organized the Healthy Homes for Kansas Conference held November 1-2, 2001. The purpose of the conference was to address the indoor environmental hazards of Kansas' homes, which are contributing to asthma, respiratory illnesses, and other negative health effects. The conference presented an opportunity for public health, housing, and environmental officials, consultants, community organizations, and others to learn about the causes and remediation methods of home hazards. The health hazards focused on during the conference included mold, lead, asbestos, radon, and factors contributing to asthma. The Healthy Homes for Kansas Conference presented an opportunity for agencies involved in healthy homes to learn more about indoor health hazards and to discuss possibilities for coordination and expansion of Kansas' resources.

Infrastructure Development Grant Highlights

The infrastructure development grant is a cooperative agreement budgeted for a three year time period (October 1, 2000 to September 30, 2003) and based on three main components: 1) develop, improve, and maintain the infrastructure needed to assure that quality training from Kansas-based training providers is available for individuals who wish to become certified as lead professionals, 2) conduct education and outreach with public housing authorities and city housing and building officials regarding lead-based paint issues so that they are able to assist with the primary prevention of childhood lead poisoning, and 3) monitor progress towards the objectives in the work plan and inform the EPA of progress according to time lines required by the grant and 40 CFR \S 745.327(d). The three objectives are accomplished by way of the PRE and Licensure and Certification programs.

■ Pre-Renovation Education Program.

- Established and maintained a quarterly newsletter, The Unleaded Post, to be sent to all entities involved in lead-based paint activities (See Publication 1).
- Established and maintained an informational website.
- Implemented an advertising campaign in which five billboards were placed in Sedgwick County to inform contractors of the new regulations.
- Distributed educational materials on the PRE Rule to building permit offices in cities with at least 5,000 residents (See Publication 2).
- Collaborated with Westlake Ace Hardware and Whelan's hardware stores statewide to send educational information on the PRE Rule in all contractor billings.
- Participated in landlord/contractor monthly meetings statewide.
- Distributed educational materials to all professors in the state involved in coursework concerning renovation and/or remodeling (See Publication 4).
- Attended home shows throughout the state to distribute material on the PRE Rule to contractors/renovators.
- Participated in a Builders Association call-in radio station in Riley County.
- Published over 25 articles in landlord association newsletters and homebuilder newsletters concerning the PRE Rule. The articles were presented in county and local publications as well as the Kansas Landlord Association newsletter, a statewide publication.
- Participated in a Kansas City cable TV community show.

■ Licensure and Certification Program.

- Seven Kansas-based organizations were accredited to provide training for lead professionals, three of which were non-profit organizations.
- Three Kansas-based training providers were accredited to offer lead safe-work practices courses.

Projects funded by the Agency for Toxic Substances and Disease Registry

■ Galena, Kansas: Superfund Subsite. Galena, Kansas is located in the southeast corner of



Cherokee county, which is located in the southeast corner of Kansas and borders both Missouri and Oklahoma. The city of Galena is included in the Tri-State Mining District of Kansas, Missouri, and Oklahoma, which is known to have produced extensive amounts of lead and zinc from 1876 until the late 1960's. The presence of the mining and smelting operations caused lead contamination of the soil surfaces surrounding the area. As a result, Galena was declared a superfund subsite encompassing nearly 24 square miles in and around the city. The current subsite is one of six former smelter subsites in Cherokee County.

As a result of the environmental contamination, the Agency for Toxic Substances and Disease Registry (ATSDR) in cooperation with the Kansas Department of Health and Environment (KDHE) decided to launch a study investigating the environmental and behavioral effects of the mining and smelting operations. The study began in 1991 and was designed to evaluate blood lead levels of children in Galena as well as to investigate environmental hazards, such as soil, dust and water contamination. The 1991 study found that children in Galena had blood lead levels significantly higher than children in a control area. As a result of the investigation findings, the EPA initiated remediation activities of surface soil and mining openings at the Galena subsite. Six hundred and ninety-seven residential yards and five day care centers were remediated during the period 1995-1998. Remediation generally consisted of removing the top 3-4 inches of soil from residential yards, schools, and other areas where young children congregated. Depending on the concentration of lead in the soil, up to 12 inches of soil remediation may have been involved.

In follow-up to the 1991 investigation, the KCLPPP conducted a new study to determine whether the yards remediated in the 1991 investigation had become recontaminated. The KCLPPP follow-up study began in 2000 and a final publication on the study will be available at the end of 2002. A letter and recruitment form were mailed in May 2000 to all Galena addresses listed in the EPA remediation database. Those who met certain qualifications were asked to participate in the follow-up study. The specified qualifications included the presence of a child in the home ranging in age from six to 72 months, residency in Galena for at least 60 days, and willingness to participate in all



Hell's Half Acre
Galena, Kansas



Pit of Despair
Galena, Kansas

phases of the study, including environmental and blood sampling. The recruitment process aided in locating the 100 children from 72 homes that were included in the study. The 100 children included represent approximately one-third of all Galena children in this age group. Participation in the study consisted of allowing testing for lead hazards both inside and outside the home. Rooms sampled for lead hazards within the home were the child's bedroom, child's playroom and the kitchen. These rooms were selected based on the amount of time children spend in each of these areas compared to other areas of the home. On the exterior, soil samples were obtained from the drip line,

designated child's play areas, garden, driveway (if unpaved) and other various areas throughout the yard. Soil hauled in from elsewhere was also tested for lead contamination. In addition to testing for lead hazards, participation in the study required a venous blood sample to be obtained from all children ranging in age from six to 72 months living in the residence. A behavioral questionnaire to assess the behavioral risk to lead exposure was also completed. The sampling period ran from July 1, 2000 to August 31, 2000.

Results comparing 1991 to 2000 showed that environmental lead levels had declined for soil lead and for dust lead. Furthermore, both the total mean blood lead levels and the percentage of children exceeding 10 : g/dL of blood lead declined from 1991 to 2000. Despite the extensive amount of education and soil remediation, there was not a significant reduction in mean soil or dust lead levels. There was, however, a reduction in blood lead levels that possibly could be attributed to either public health education or the EPA intervention.



Eagle Picher smelter site
Galena, Kansas

The follow-up study-sampling period was completed on August 31, 2000. However, funding provided by the ATSDR has continued into 2001 and has been used to support statistical analysis of the recent data gathered as well as to prepare a project report of study findings. The KCLPPP contracted with Dr. John Neuberger, University of Kansas Medical Center, to perform the statistical analysis and project write-up of the Galena study.

MEDICAL SURVEILLANCE

The Medical Surveillance program is primarily responsible for identifying, monitoring and tracking Kansas children with blood lead levels greater than or equal to 10 : g/dL as well as developing policies and procedures concerning the proper care of lead-poisoned children. The KCLPPP nurse consultant acts as the liaison between agencies and organizations for lead toxic children and is responsible for providing educational materials, workshops, training sessions and other support to local health departments, health professionals and providers about lead toxicity and its management. The Medical Surveillance section is further accountable for developing and implementing case management guidelines of lead-poisoned children.

Children who reside in Kansas may receive a verbal screening, which consists of a series of questions to determine whether the child is exposed to environmental risk factors, prior to the initial blood lead test. If the verbal screening indicates the child is at risk for lead poisoning, a blood sample will be obtained. Most initial blood lead samples are capillary blood samples requiring two drops of blood. A child receiving an initial capillary blood lead level of 10 : g/dL or greater will receive a confirmatory venous blood sample. A confirmed case is defined as a venous blood lead level at or above 10 : g/dL or capillary blood lead results at or above 10 : g/dL confirmed by retesting with venous blood, or two capillary blood results greater than or equal to 10 : g/dL within 12 weeks of each other. In CY 2001, there were 262 confirmed cases reported to the KCLPPP. This number is nearly three times greater than CY 2000 in which there were 94 confirmed cases.

Kansas state regulations require that all clinical laboratories and providers report any blood lead level at or above 10 µg/dL to the KCLPPP. However, regulations are being modified to require all blood lead levels to be reported. All data received by the KCLPPP is entered into the Systematic Tracking of Elevated Lead Levels and Remediation Data System (STELLAR). Based on 1998 CDC guidelines, Kansas implemented a universal screening recommendation: Using a blood lead test, screen all children at 12 and 24 months of age and screen all children from 36-72 months of age who have not been screened previously. High-risk children should have a first blood lead test at six months of age. Medical evaluation and environmental investigation and remediation should be done for all children with blood lead levels at or above 20 : g/dL.

The KCLPPP matches Medicaid identification numbers with children in the STELLAR database. This gives an idea of the number of children at high-risk for lead exposure that are actually being tested for lead poisoning. In CY 2001, 3,962 children, ranging in age from birth to 72 months and affiliated with Medicaid participation, received a blood lead test. This means that 38% of children tested in CY 2001 were Medicaid participants. Of the 3,962 Medicaid children tested, 423 had an elevated blood lead level at or above 10 : g/dL.

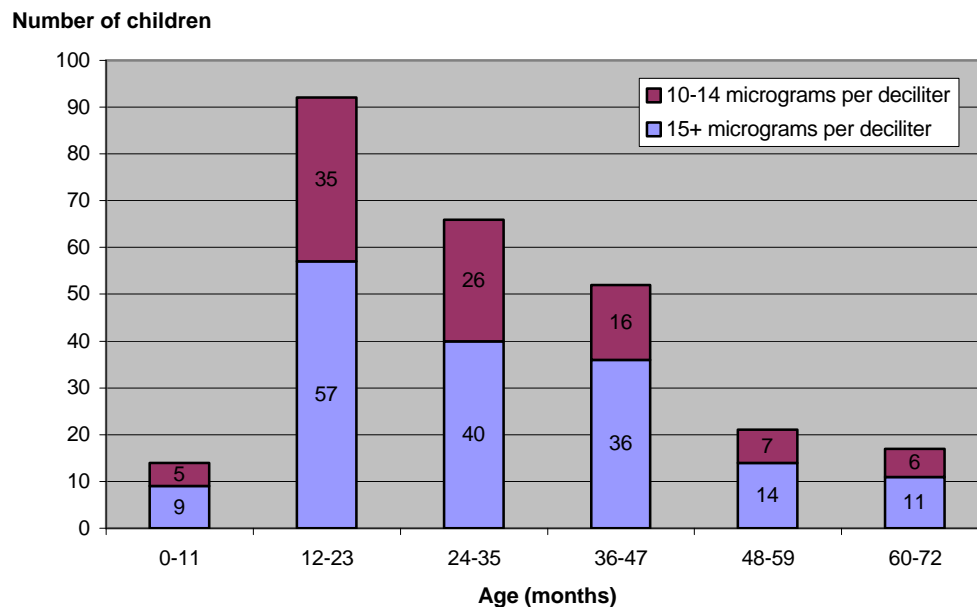
Blood Lead Testing

A total of 10,541 children, ranging in age from birth to 72 months, were tested during CY 2001, nearly doubling the same group in CY 2000. Of the 10,541 receiving blood lead tests in CY 2001, 659 required confirmatory testing. This is less than 6.3% of all children tested for lead poisoning in CY 2001.

A total of 285 children out of the 659 requiring confirmatory testing received venous blood samples in CY 2001. This accounts for 43.2% of children needing confirmation. Of the 285 children receiving confirmatory blood lead levels, 42 children (14.7%) had blood lead levels less than 10 : g/dL. A total 154 of the 285 children (54%) were screened and confirmed with blood lead levels ranging from 10-14 : g/dL while 39 children (13.7%) were screened and confirmed with blood lead levels ranging from 15-19 : g/dL. A total of 48 children were screened and confirmed with blood lead levels at or above 20 : g/dL. This accounts for 16.8% of children receiving confirmatory blood lead tests.

■ **Testing by age.** A total of 202 children, ranging in age from birth to six months, during the CY 2001 received a blood lead test. Compared to the 98 tests performed in CY 2000 in this same age group, the number of children tested in CY 2001 has more than doubled. A total of 5,357 children, ranging in age from seven to 35 months, received blood lead tests during CY 2001. Compared to the 3,262 tests performed in CY 2000 in this same age group, there has been a 64.2% increase in testing. The total number of children less than 72 months of age but greater than 36 months of age tested for lead poisoning increased from 3,099 in CY 2000 to 4,280 in CY 2001, a rise of 38.1%.

Pediatric lead poisoning confirmed cases (262) by age group in Kansas, 2001



■ **Testing by County.** Wyandotte County had the greatest number of children tested for lead poisoning in CY 2001. Of the 1,000 children tested, 64 were found to have an elevated blood lead level at or above 10 $\mu\text{g}/\text{dL}$. Sedgwick and Shawnee counties also reported high numbers of children with elevated blood lead levels in CY 2001 with 66 and 51 children respectively, birth to 18 years of age, reported with blood lead levels at or above 10 $\mu\text{g}/\text{dL}$.

A total of 29 counties reported zero children having blood lead levels at or above 10 $\mu\text{g}/\text{dL}$. These counties included: Chase, Cheyenne, Clark, Decatur, Gove, Grant, Gray, Greeley, Hamilton, Hodgeman, Kearny, Kingman, Lane, Linn, Logan, Marion, Morton, Norton, Osborne, Phillips, Rawlins, Republic, Rice, Sheridan, Sherman, Smith, Thomas, Wabaunsee and Wallace.



Children participating in blood lead screening at a health fair promotion in Saline County.

Projects Funded by the Centers for Disease Control

Advertising Campaign. The KCLPPP, in partnership with local health departments, initiated a \$100,000 advertising campaign. The campaign began in late July and ended in September and was designed to increase lead screening and awareness in 26 designated counties throughout the state. Phase I of the advertising campaign involved a \$40,000 effort in 20 Kansas counties. The 20 counties were selected to receive targeted advertising support to implement lead poisoning prevention activities due to having risk factors related to childhood lead poisoning. The selected counties were: Atchison, Allen, Butler, Bourbon, Barton, Cowley, Crawford, Douglas, Dickinson, Ellis, Ford, Finney, Harvey, Lyon, Labette, Leavenworth, Montgomery, Riley, Sumner and Seward. The majority of advertising was done through local newspapers and radio stations. First Lady Linda Graves spoke in a Public Service Announcement that was aired throughout the state. Billboards were placed in Butler, Harvey, Lyon, and Sumner counties to encourage parents to get their children tested for lead poisoning. As a result of the campaign, the counties involved in Phase I saw an overall increase in blood



Sample poster used throughout the top six counties advertising Childhood Lead Screening Week and free lead screening.

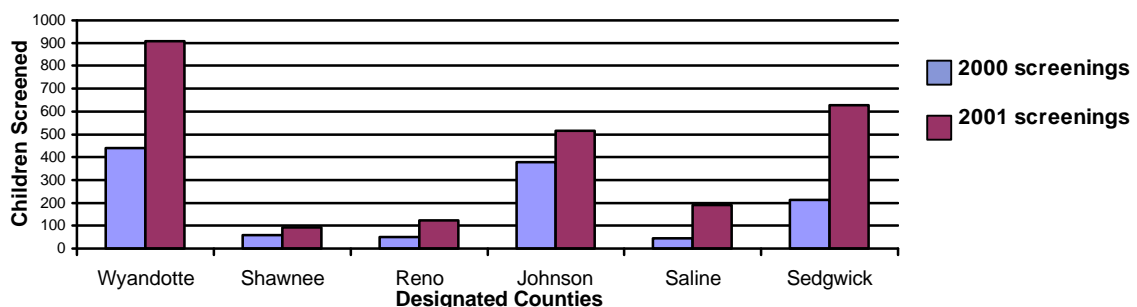
lead testing of 25% compared to the same time period in 2000. Leavenworth County had the largest percentage increase in blood lead screening of children ages birth to 72 months. In Leavenworth, numbers of children in this age group rose from 15 children tested between June 2000 and November 2000 to 119 children tested between June 2001 and November 2001, an increase of nearly 8 times the 2000 data. Phase II of the campaign involved a \$60,000 effort allocated to six additional Kansas counties. The selected counties were: Shawnee, Johnson, Sedgwick, Saline, Reno, and Wyandotte. These counties had the highest risk factors related to childhood lead poisoning hazards. Representatives from each county met with the KCLPPP and a selected advertising agency to determine the best media for their respective counties. Similar advertising methods used in Phase I were used in Phase II. Educational materials were distributed at county festivals and fairs. In certain counties, free lead screening took place at different events in the area. As a result of the campaign, the counties involved in Phase II saw an overall

increase in blood lead testing of 35% compared to the same time period in 2000. Sedgwick County had the largest percentage increase in blood lead screening of children ages birth to 72 months. In Sedgwick, the number of children screened in this age group nearly tripled from 280 children screened in 2000 to 700 children screened in the same time period in 2001.



Sample billboard used in Phase II of the advertising campaign.

Comparison of 2000 & 2001 Screenings

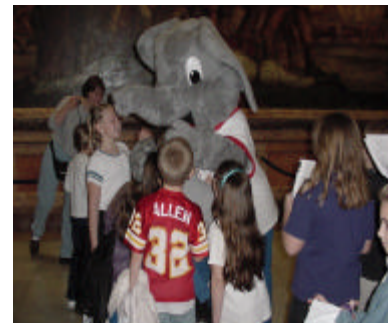


Filter Paper Pilot Project. The KCLPPP collaborated with Douglas and Saline county health departments to offer filter paper testing in order to increase the percentage of children screened for lead poisoning. The pilot project began June 1, 2001 and ended September 1, 2001. As a result of the pilot project, screening increased nearly four times in Douglas County in 2001 compared to the same time period in 2000. Screening in Saline County increased from 24 children in 2000 to 149 children in 2001, a more than six-fold increase.

The filter paper pilot project was highly regarded by the nurses in both Saline and Douglas counties. Obtaining blood samples through the filter paper testing technique is less traumatic for the child, the child's family, and the nurse performing the test and is considered to be a quicker method of blood sample collection. During the pilot project there were no reports of rejection of specimens sent for analysis and only one test had a questionable result. When the venous sample was obtained and analyzed the results were within tenths of the paper sample. As a result, the KCLPPP has approved the use of filter paper as an additional screening tool for lead testing. The possibility of filter paper analysis being conducted in a similar manner as currently established capillary testing protocols is being examined by the KCLPPP.

Other Projects. Other projects funded by the Centers for Disease Control include:

- Developed and distributed The Unleaded Post, a quarterly newsletter sent to the Kansas Lead Council and each of the 105 county health departments (See Publication 1).
- Developed case management guidelines for the lead-poisoned child (See Publication 6).
- Designed and ordered a program mascot, Edgar the Elephant, to attend preschools, daycares, Head Starts, health fairs and other events in order to increase lead awareness among children.
- Purchased a display board for health fairs and other events.
- Developed educational materials for use at health fairs and other events.
- Purchased the reagents necessary to analyze blood samples using the ten Lead Care Machines jointly owned by the KCLPPP and the Division of Health and Environmental Laboratories.
- Developed prenatal/infant and toddler/preschool packets equipped with educational materials on lead poisoning and its effect on a child's health as well as preventative measures to reduce lead poisoning.
- Printed screening plans and an accompanying poster to be distributed to health facilities outlining the universal screening guidelines (See Publications 3 and 5).
- Developed of a coupon campaign encouraging children to get tested for elevated blood lead levels by offering small gifts as incentives.
- Provided funding for a lead case management nurse in Wyandotte County.
- Offered mini-grants to six counties for purposes of administering a lead poisoning prevention program and grants to two counties for purposes of testing WIC children.



Edgar at the annual Kansas Day celebration at the Capitol.
The program mascot entertained children and met Governor Bill Graves.

FUNDING SOURCES

Name	Position	EPA Program	EPA Enforcement	ATSDR	EPA/HUD	CDC	Fee Fund
Barry Brooks	Program Director	60%				40%	
Tom Morey	Licensure & Certification Program Manager	75%	25%				
Maria Albert	Pre-Renovation Education Program Manager	75%	25%				
Ronda Sanders	Nurse Consultant					100%	
Robin Norris	STELLAR Coordinator					100%	
Cory Lambrecht	Enforcement Officer	50%	50%				
Cassandra Baldwin	Compliance Assistance Officer				100%		
Jessica McDonald	Public Health Educator		35%		10%	40%	
Jessica Evans	Special Project Officer			100%			
Bonnie Fritts	Administrative Assistant					50%	50%
Chrishundra Mitchell	STELLAR Data Management					100%	



The Kansas Childhood Lead Poisoning Prevention Program along with Governor Bill Graves.

GRANT HIGHLIGHTS

The KCLPPP awarded mini-grants to 18 counties and one professional lead organization during CY 2001 for a total of \$93,260. The grants were awarded to meet the following objectives:

To provide the following counties with funds to administer blood lead testing to WIC participants ages one and two and children 30-60 months

Finney.....\$20,003

Wyandotte.....\$20,036

To provide the following counties with funds to administer a lead poisoning prevention program

Dickinson.....\$3,528

Geary.....\$5,000

Jefferson.....\$3,643

Johnson.....\$10,401

Lincoln.....\$1,904

Marion.....\$1,241

McPherson.....\$3,900

Saline.....\$4,450

Southcentral Kansas Coalition for Public Health
Barber, Edwards, Harper, Kingman, Kiowa, Pratt.....\$5,000

Wilson.....\$2,354

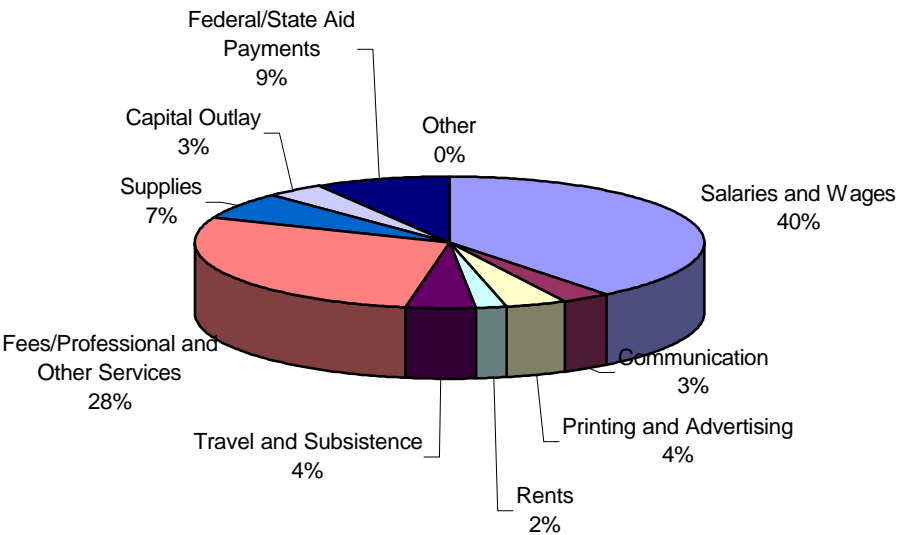
Wyandotte.....\$2,000

To provide LeadBusters, Inc. with funds to administer a lead poisoning prevention program.....\$9,800

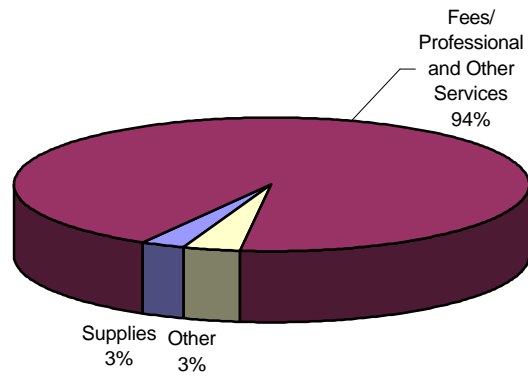
Total grants approved.....\$93,260

EXPENDITURE HIGHLIGHTS

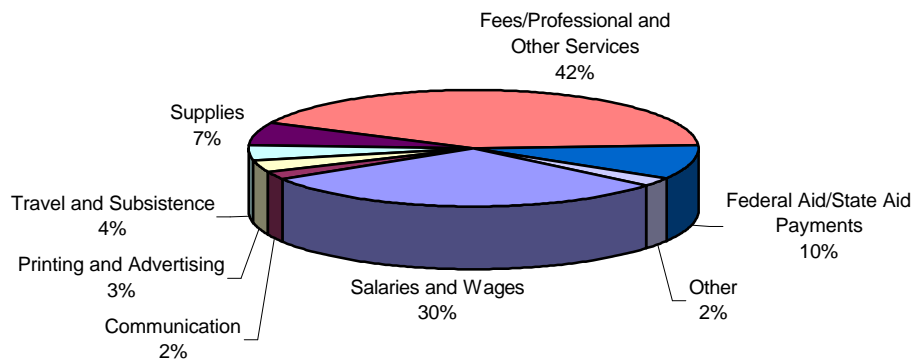
Total Expenditures



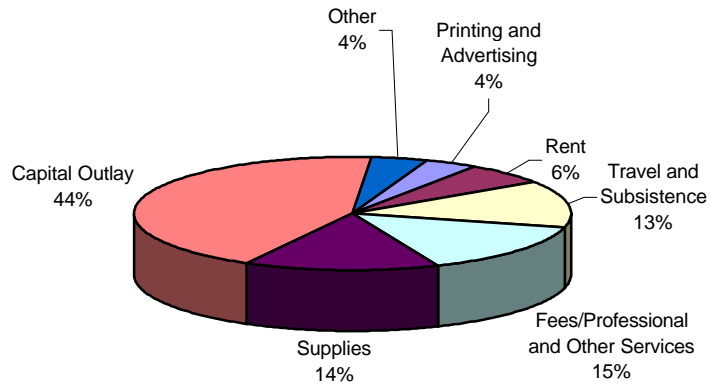
ATSDR Grant Expenditures



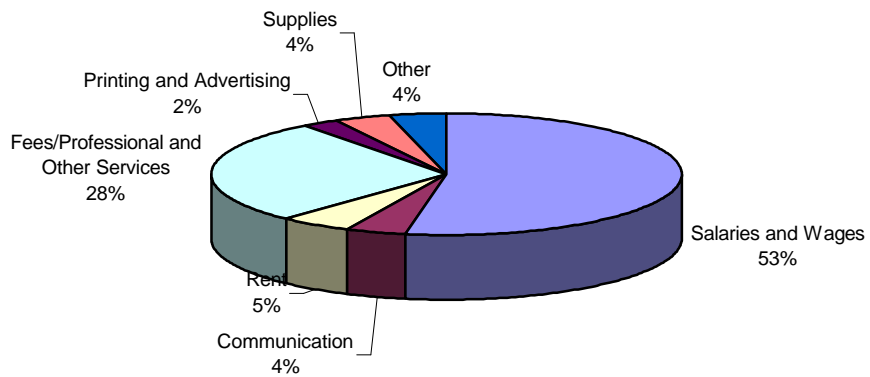
CDC Grant Expenditures



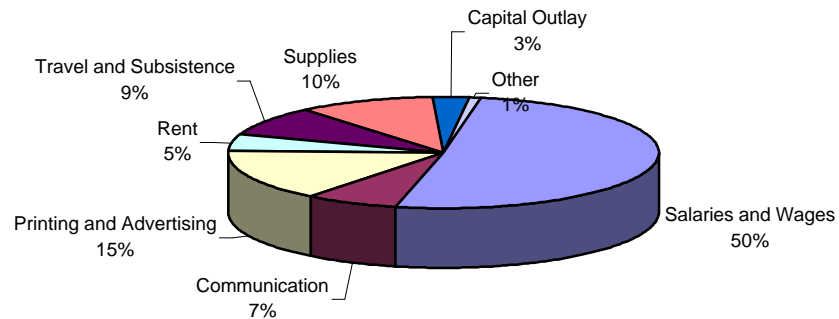
EPA Enforcement Grant Expenditures



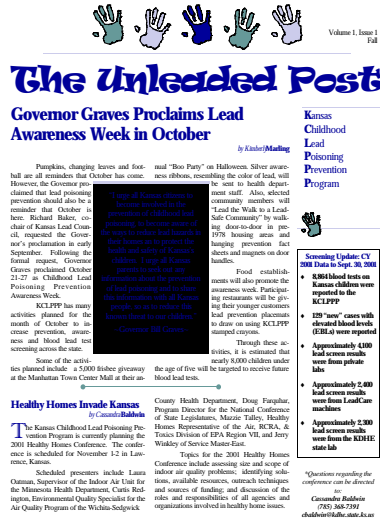
EPA Program Grant Expenditures



HUD Grant Expenditures



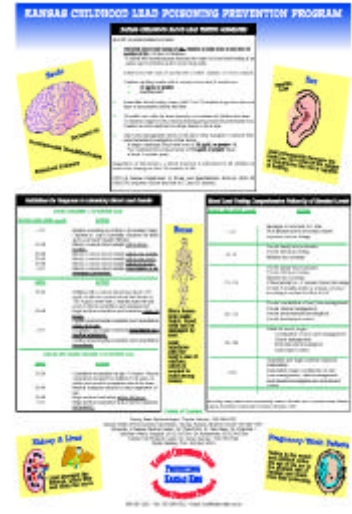
KCLPPP PUBLICATIONS



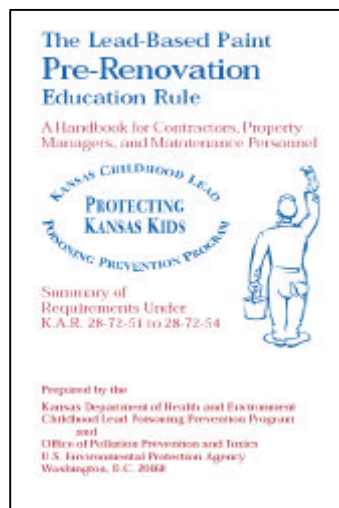
Publication 1



Publication 2



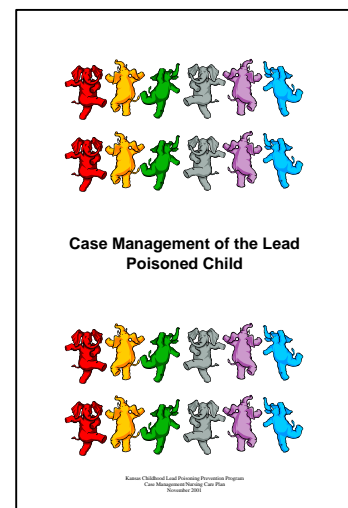
Publication 3



Publication 4

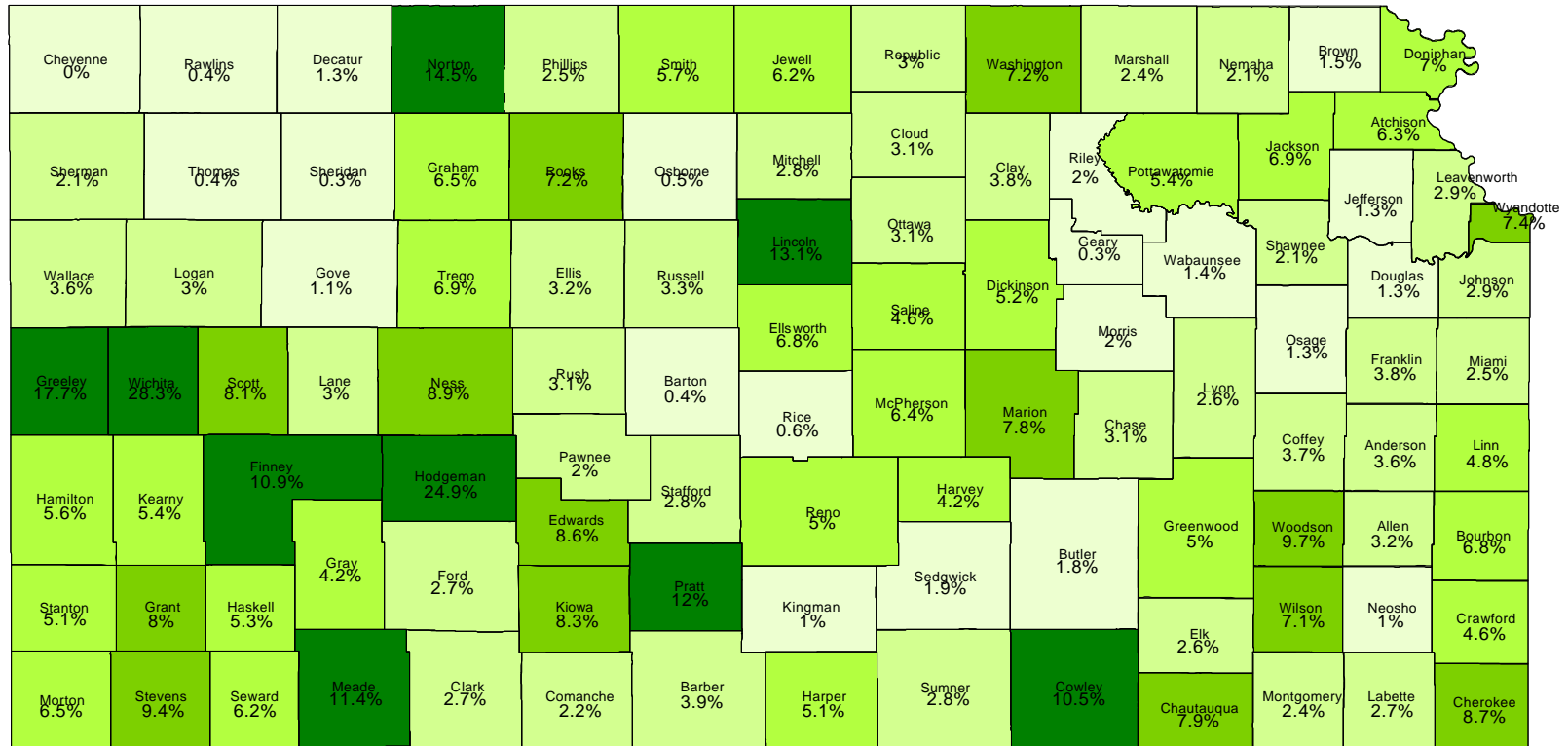


Publication 5



Publication 6

Gross Lead Testing Rates By County 2001



2001 Lead Testing Rates (number of counties)

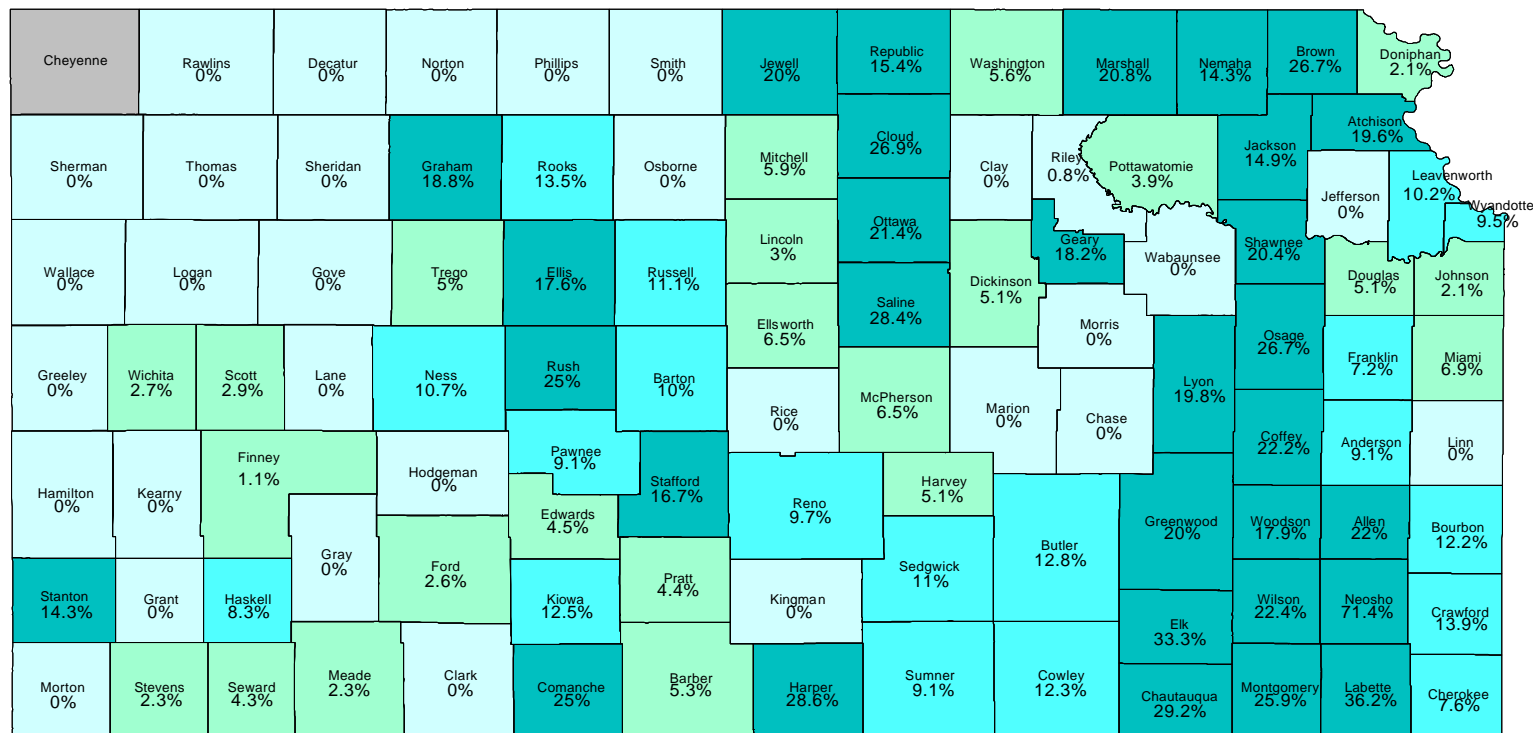
- 10% or more (9)
- 8% to 10% (14)
- 6% to 8% (26)
- 2% to 4% (35)
- 0% to 2% (21)

Gross lead testing rates were determined by dividing the number of children in each county up to 72 months of age by the total number of children in each county up to 72 months of age.

Rates are based on grouping zip code areas. Zip codes spanning multiple counties were aggregated into only one county. This decreases the confidence in the data for those counties.

Rates are based on 1990 census data and Are considered preliminary.

Gross Lead Poisoning Rates By County 2001



Lead Poisoning Rates (number of counties)

14% to 72%	(31)
7% to 14%	(19)
1% to 7%	(23)
0% to 1%	(31)
NA (none tested)	(1)

Gross lead poisoning rates were determined by dividing the number of children in each county up to 72 months of age reported to have blood lead levels at or above 10 micrograms per deciliter by the total number of children in each county up to 72 months of age.

Rates are based on grouping zip code areas. Zip codes spanning multiple counties were aggregated into only one county. This decreases the confidence in the data for those counties.

Rates are based on 1990 census data and are considered preliminary.

County Burden of Risk Matrix for Kansas Childhood Lead Poisoning

County	Rank	Total Rank Score	Population 0-5 yrs 2000		# < 5 yrs below poverty 1998		WIC Participation 0-5 yrs 2000		Medicaid Participation 0-5 yrs 2000		Hispanic+Non-White Population 2000		% 2yr olds Fully Immunized 2000		#EBL Reported to KDHE 2000		# Potential Pre-1950 Housing Units 2000		# Potential Industry Sources 2000	
			Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank	
Wyandotte	1	25	12789	3	3504	2	6264	2	5835	2	76414	2	41	2	6	6	24283	2	2	3.5
Sedgwick	2	34	35777	1	7717	1	11066	1	11497	1	106877	1	57.2	25	12	2	44227	1	4	1
Montgomery	3	94	2176	17	618	11	1167	16	900	14	5619	16	48.2	6	8	4.5	9212	6	2	3.5
Shawnee	4	129	11552	4	2304	4	4699	3	4091	3	34144	4	74.5	95	11	3	19171	3	1	10
Johnson	5	132	33832	2	2714	3	3381	5	2391	4	49619	3	75.8	100	5	7.5	13794	4	2	3.5
Finney	6	152	4255	7	674	10	2932	6	1299	7	19694	5	53	12	3	9	2377	37	0	59
53% of Population 0-5 years																				
Barton	7	159	1806	21	403	18	1033	18	754	18	3102	20	55.9	20	1	19.5	5245	14	1	10
Lyon	8	170	2480	14	492	15	1345	12	878	15	8157	12	69	65	2	11.5	5217	15	1	10
Ford	9	187	3052	12	537	13	2345	7	1095	10	13859	7	60.9	36	1	19.5	3852	23	0	59
Cherokee	10	201	1560	26	418	17	805	21	654	20	1898	24	51.8	11	8	4.5	4683	18	0	59
Leavenworth	11	204	4809	6	728	8	1189	15	1009	11	12364	8	69.8	69	0	65.5	6616	11	1	10
Labette	12	214	1416	27	335	22	651	22	653	21	2785	23	50.6	10	0	65.5	5266	13	1	10
Butler	13	215	4105	9	599	12	967	20	929	13	3806	19	66.8	54	0	65.5	5921	12	1	10
Cowley	14	217	2323	16	466	16	1153	17	942	12	4209	17	65.9	52.5	1	19.5	7585	8	0	59
Crawford	15	218	2448	15	510	14	1283	13	1103	9	2944	21	54.3	14	0	65.5	8281	7	0	59
Douglas	16	219	5598	5	950	5	1511	10	1394	6	15394	6	76	101	0	65.5	6803	10	1	10
Saline	17	222	3699	10	675	9	1620	9	1237	8	6967	15	74	93	0	65.5	7494	9	2	3.5
Reno	18	229	4147	8	910	7	1798	8	1583	5	6997	14	67.5	57	0	65.5	11254	5	0	59
Geary	19	234	2628	13	946	6	3562	4	782	17	10759	11	59.8	28.5	0	65.5	2987	30	0	59
Riley	20	238	3583	11	338	21	1396	11	733	19	10871	10	71.5	78	5	7.5	4493	21	0	59
Bourbon	21	261	939	34	276	24	432	32	421	26	1030	36	56.9	24	17	1	3343	25	0	59
Sumner	22	271	1713	23	214	31	539	27	436	25	1868	25	64.5	45.5	1	19.5	4846	16	0	59
Harvey	23	280	2170	18	347	20	1003	19	526	23	3911	18	73.3	87	0	65.5	4682	19	1	10
Wilson	24	297	600	43	127	41	383	35	238	37	423	56	56.1	22	1	19.5	2781	33	1	10
Neosho	25	299	1020	33	221	30	533	28	440	24	1121	34	39.6	1	0	65.5	3611	24	0	59
Ellis	26	300	1596	25	269	25	567	26	408	27	1347	30	68.9	62.5	2	11.5	2752	34	0	59
Atchison	27.5	303	1074	32	253	28	450	30	366	30	1610	26	47.3	5	0	65.5	3264	27	0	59
Franklin	27.5	303	1686	24	282	23	606	23	570	22	1586	27	61.4	37	0	65.5	3868	22	0	59
Miami	29	323	1957	20	201	32	471	29	389	29	1417	29	60.3	30.5	0	65.5	3063	29	0	59
Allen	30.5	351	849	36	194	34	427	33	404	28	863	40	59.5	27	0	65.5	3197	28	0	59
Dickinson	30.5	351	1103	30	227	29	436	31	340	31	928	37.5	65.1	48	0	65.5	4652	20	0	59
84% of Population 0-5 years																				

Seward	32	354	2161	19	395	19	0	103	834	16	11390	9	47	4	0	65.5	1587	59	0	59
Brown	33	373	687	40	198	33	346	38	295	34	1490	28	63	40	0	65.5	2660	35	0	59
Marshall	34	395	549	45.5	141	39	183	60.5	141	51.5	7886	13	60.8	35	0	65.5	3271	26	0	59
Rice	35	398	625	41	131	40	353	37	226	38	925	39	63.7	42	0	65.5	2538	36	0	59
Marion	36	404	735	38	266	26	337	39	185	43.5	534	52	65.7	50	0	65.5	2959	31	0	59
Osage	37.5	407	1087	31	192	35	405	34	329	33	601	49	67.6	58	0	65.5	2218	42	0	59
McPherson	37.5	407	1744	22	153	38	595	24	337	32	300	64	72.9	85	0	65.5	4732	17	0	59
Pottawatomie	39	411	1348	28	254	27	357	36	283	35	928	37.5	72.5	80	0	65.5	2200	43	0	59
Grant	40	429	689	39	107	47	592	25	253	36	2886	22	60.7	34	0	65.5	497	101	0	59
Pratt	41	430	570	44	97	49	265	46.5	185	43.5	549	51	60.5	32.5	0	65.5	2347	39	0	59
Linn	42	436	603	42	108	46	303	41	214	39	296	65	54.8	16	0	65.5	1553	62	0	59
Russell	43	440	369	62	72	60	214	53	161	49	221	72	55.9	20	1	19.5	2043	45.5	0	59
Greenwood	44	443	423	56	88	52	248	50	205	42	322	61	55.1	17.5	0	65.5	2338	40	0	59
Clay	45	445	477	52	125	43	265	46.5	141	51.5	247	69	70.1	71	2	11.5	2308	41	0	59
Jefferson	46	447	1180	29	168	37	273	44	206	41	737	42	72.7	82.5	0	65.5	2032	47	0	59
Doniphan	47.5	456	528	48	93	50	178	63.5	166	48	470	54.5	54	13	0	65.5	1714	54	0	59
Jackson	47.5	456	874	35	169	36	330	40	213	40	1316	32	79.3	103	0	65.5	2043	45.5	0	59
Cloud	49.5	472	504	50	37	87	295	42	184	45	205	74	55.1	17.5	0	65.5	2900	32	0	59
Anderson	49.5	472	503	51	117	44	201	54	169	47	251	68	60.3	30.5	0	65.5	1746	53	0	59
Stafford	51.5	483	273	73	61	66	198	56	117	59	335	59	64	43	2	11.5	1683	56	0	59
Nemaha	51.5	483	761	37	126	42	194	58	126	56	225	71	76.6	102	1	19.5	2375	38	0	59
Haskell	53	493	392	60	39	84.5	1261	14	115	60	1119	35	55.9	20	0	65.5	579	95	0	59
Kingman	54	502	530	47	113	45	272	45	127	55	303	63	70.4	73	0	65.5	2001	49	0	59
Pawnee	55	504	406	58	58	68	220	52	120	58	810	41	64.5	45.5	0	65.5	1591	57	0	59
Sherman	56	510	413	57	74	57.5	290	43	182	46	676	43	70.1	71	0	65.5	1386	68	0	59
Coffey	57	522	524	49	102	48	181	62	139	53	328	60	67.2	55	0	65.5	1346	70	0	59
Stevens	58	525	448	54	55	69.5	0	103	154	50	1338	31	49.8	7	0	65.5	857	86	0	59
Norton	59	536	286	70	73	59	168	67	77	74	470	54.5	59.8	28.5	0	65.5	1590	58	0	59
Gray	60	542	461	53	80	56	249	49	95	65	673	44	69.5	68	0	65.5	985	82	0	59
Chautauqua	61.5	545	197	79	89	51	139	72.5	85	70	305	62	54.6	15	0	65.5	1301	71	0	59
Phillips	61.5	545	331	67	85	54	184	59	97	64	132	84	60.5	32.5	0	65.5	1582	60	0	59
Kearney	63	547	399	59	60	67	200	55	113	61	1309	33	65.6	49	0	65.5	534	98	0	59
Barber	64	562	266	74	66	63.5	97	83	78	73	201	75.5	68.1	59	1	19.5	1699	55	0	59
Thomas	65	564	549	45.5	84	55	245	51	134	54	252	67	74.1	94	0	65.5	1259	73	0	59
Republic	66	573	263	75	64	65	139	72.5	79	72	116	88	58.9	26	0	65.5	1951	50	0	59
Harper	67	585	367	63	71	61	178	63.5	126	57	215	73	73.8	92	0	65.5	1865	51	0	59
Mitchell	68	587	354	64	66	63.5	134	75	72	76.5	201	75.5	68.3	60	0	65.5	2011	48	0	59
Ellsworth	69	595	275	72	55	69.5	151	69	91	67	574	50	73.7	91	0	65.5	1796	52	0	59
Morris	70	600	348	66	69	62	138	74	98	62.5	231	70	71.4	77	0	65.5	1505	64	0	59
Rooks	71	603	319	68	74	57.5	196	57	92	66	198	77	73.6	89.5	0	65.5	1531	63	0	59
Elk	72	604	137	97	33	92.5	91	86	59	81	179	80	50.1	8.5	1	19.5	1050	80	0	59
Wabunsee	73	610	427	55	44	75.5	109	80	87	68	254	66	71.1	76	0	65.5	1504	65	0	59
Washington	74	613	370	61	54	71	157	68	81	71	103	91	72.7	82.5	0	65.5	2113	44	0	59
Meade	75	622	50	105	45	73.5	250	48	98	62.5	611	46.5	72.6	81	0	65.5	987	81	0	59
Ottawa	76	626	352	65	86	53	123	77	86	69	191	79	75.2	97	0	65.5	1567	61	0	59
Woodson	77	632	190	83	29	97.5	88	87	75	75	143	82	50.1	8.5	0	65.5	1185	74	0	59

Morton	78	633	284	71	48	72	0	103	72	76.5	604	48	62	38	0	65.5	505	100	0	59
Scott	79	634	313	69	39	84.5	183	60.5	51	85	373	58	68.9	62.5	0	65.5	798	90	0	59
Osborne	80	638	205	77	43	78	141	71	70	78	75	99	63.1	41	0	65.5	1385	69	0	59
Edwards	81	640	204	78	41	80.5	126	76	62	79	379	57	69.4	67	0	65.5	1098	78	0	59
Graham	82	650	133	99	43	78	121	78	32	98.5	156	81	46.5	3	0	65.5	821	88	0	59
Wichita	83	659	211	76	29	97.5	177	65	61	80	506	53	68.7	61	0	65.5	397	102	0	59
Stanton	84	690	191	82	24	99	174	66	56	82.5	625	45	73.2	86	0	65.5	258	105	0	59
Smith	85	696	196	80	38	86	105	81	56	82.5	72	100	70.8	75	0	65.5	1451	67	0	59
Cheyenne	86	702	149	94	40	82.5	65	93	40	91	113	90	64.2	44	0	65.5	977	83	0	59
Gove	88	706	182	86.5	45	73.5	57	95.5	33	96.5	79	98	62.4	39	0	65.5	657	92	0	59
Decatur	88	706	157	93	43	78	72	90	37	94	86	94.5	67.3	56	0	65.5	1149	76	0	59
Jewell	88	706	175	90	44	75.5	80	89	46	89	68	101	70.1	71	0	65.5	1492	66	0	59
Hamilton	90.5	708	185	85	34	90.5	103	82	55	84	611	46.5	74.7	96	0	65.5	533	99	0	59
Chase	90.5	708	182	86.5	32	94	70	91	48	87.5	121	87	65.9	52.5	0	65.5	875	85	0	59
Rush	92	709	171	91	33	92.5	83	88	37	94	81	97	64.7	47	0	65.5	1167	75	0	59
Ness	93	710	177	89	30	95.5	51	98	24	101.5	86	94.5	70.6	74	1	19.5	1070	79	0	59
Kiowa	94	711	181	88	36	88	147	70	51	86	124	86	72.8	84	0	65.5	888	84	0	59
Clark	95	712	146	95	18	102	49	99	37	94	141	83	56.8	23	0	65.5	765	91	0	59
Logan	96	724	195	81	34	90.5	112	79	48	87.5	115	89	72.4	79	0	65.5	606	93	0	59
Rawlins	97	732	134	98	40	82.5	58	94	28	100	59	104.5	65.8	51	0	65.5	1099	77	0	59
Trego	98	736	170	92	22	100	94	84	43	90	89	93	69	65	0	65.5	848	87	0	59
Lincoln	99	738	187	84	41	80.5	93	85	38	92	85	96	81.1	104	0	65.5	1262	72	0	59
Greeley	100	783	103	102	9	105	0	103	24	101.5	196	78	69	65	0	65.5	306	104	0	59
Wallace	101	800	98	104	30	95.5	68	92	33	96.5	125	85	75.7	99	0	65.5	336	103	0	59
Hodgeman	102	810	101	103	17	103.5	47	100	16	105	93	92	73.5	88	0	65.5	588	94	0	59
Lane	103	813	115	100	21	101	57	95.5	20	103.5	64	102	73.6	89.5	0	65.5	537	97	0	59
Comanche	104	815	111	101	17	103.5	54	97	32	98.5	60	103	75.6	98	0	65.5	802	89	0	59
Sheridan	105	822	141	96	35	89	0	103	20	103.5	59	104.5	81.3	105	0	65.5	555	96	0	59
Total			188883		34141		69793		52997		460874		6799.4		94		345564		21	
Mean			1799		325		665		505		4389		128		1		3291		0	
Median			461		86		214		139		506		65.9		0		1746		0	

Factors identified have been associated with increased risk of lead poisoning.

Counties were ranked for each factor with a score of one representing the greatest burden.

The rank scores were then totaled for each county to give a measure of the composite burden of risk.

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